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AUTHOR Grinstead, Olga A.
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ABSTRACT

Personality and physiological, cognitive, and environmental factors have all been suggested as critical variables in smoking cessation and relapse. Weight gain and the fear of weight gain after smoking cessation may also prevent many smokers from quitting. A sample of 45 adult smokers participated in a study in which three levels of preventive weight control intervention (weight control discussion; discussion with monitoring of eating habits; and discussion, monitoring, and homework exercises), combined with smoking control treatment, were compared for effectiveness in producing smoking cessation and preventing weight gain during and following treatment. Results showed all participants indicated a posttreatment abstinence rate of 43%, a percentage lower than that found in previous studies. No signficant differences were found between the three treatment conditions in percentage of participants abstinent at 1 and 6 months posttreatment. A significant treatment effect was found for the intermediate treatment group which showed a 50% abstinence rate at 6 months posttreatment, compared to 15% and 29% for the other groups. Treatment condition was not found to affect body weight. Although treatment manipulation was expected to affect body weight, the absence of weight differences between groups may be related to the structure and social support the treatment groups provided to participants. (JAC)

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BEHAVIORAL TREATMENT APPROACHES TO PREVENT WEIGHT GAIN FOLLOWING SMOKING CESSATION

Olga A. Grinstead

The Claremont Colleges

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INTRODUCTION

Relapse following smoking control treatment continues to be an important clinical, theoretical and methodological concern. Even the most impressive treatment results show the percentage of abstinent participants to decrease from 100% at posttreatment to 60% at six months following treatment (Lichtenstein, Harris, Birchler, Wahl and Schmahl, 1973). Best (1977) reported that 42% of subjects abstinent at posttreatment relapsed within six months. Norton and Barske (1977) found that while over 90% of their subjects were abstinent at post-treatment, this figure declined to 40% by three months and to 30% by six months following treatment. Generally the steepest relapse curves are found during the first three months following treatment and particularly in the first posttreatment month (Lichtenstein and Danaher, 1976; Marlatt and Gordon, 1979).

Investigations of the relapse process have included several theoretical analyses (Marlatt and Gordon, 1979; Sjoberg and Johnson, 1976) and correlational studies attempting to predict successful maintenance (e.g. Krasnegor, 1979; Vogt, Selvin and Billings, 1979). Personality, physiological, cognitive and environmental factors have been suggested as critical variables in smoking cessation and relapse. To date, however, no theory of smoking relapse has produced a generally accepted explanation for the steep relapse curves observed in most smoking control treatment outcome studies. Attempts to prevent relapse with the use of booster sessions have also met with little success (e.g. Best, 1977; Colletti and Supnick, 1980).

Reviewers have suggested that some percentage of relapse following

smoking cessation treatment may be due to weight gain as ex-smokers who gain weight may resume smoking as a weight control strategy. Reporting on the two month follow-up data from his smoking clinic and noting weight gain among the majority of those who quit successfully, Wilhelmsen (1968) writes "...many persons found it (weight gain) troublesome...to such a degree that it seriously affected their ability to continue abstinence from tobacco" (page 256). The Surgeon General's report (Smoking and Health, 1979) also notes that women have more difficulty quitting smoking than do men and attributes this effect to decreased tolerance of weight gain among women.

There exists substantial evidence that weight gain occurs frequently following smoking control attempts. Several longitudinal investigations have found that individuals who quit smoking gain more weight over time than those who continue to smoke (e.g. Comstock and Stone, 1972; Khosla and Lowe, 1972; Garvey, Bosse and Seltzer, 1967). While cautioning that weight gain is not universal in ex-smokers, these studies report a majority of their abstinent participants to have gained significant amounts of weight. An alternative interview research strategy used by Wynder, Kaufman and Lester (1967) produced results similar to those in the longitudinal studies.

In addition to the role of weight gain in smoking relapse it is likely that fear of weight gain prevents many smokers from attempting cessation. Khosla and Lowe (1972) found that many smokers in their sample held the erroneous belief that overweight is more harmful than cigarette smoking when in fact the health benefits of smoking cessation are not offset by even a large weight gain (Heyden, Cassel and Baitel,

1971). Fear of weight gain may also serve as a convenient rationalization for not attempting cessation of an excuse to resume smoking.

Research evidence generally supports a behavioral rather than a metabolic explanation for weight gain following smoking cessation. First, weight gain due to metabolic factors related to cigarette smoking would be expected to be a more universal and consistent phenomenon. Also, ex-smokers frequently report changes in their eating behavior after they quit smoking. Eighty-three percent of the subjects interviewed by Wynder et al. (1967), for example, reported increased food intake following smoking control and the authors found no evidence of weight gain without reported increases in caloric intake.

The evidence regarding the relationship of smoking and body weight indicates that weight gain following smoking control treatment is common but not inevitable and suggests that preventive weight control intervention may be a useful adjunct to smoking control treatment. Such an intervention could help participants avoid weight gain and smoking relapse attributable to weight gain of fear of weight gain thereby improving long term outcome results. While the application of such a treatment approach has been limited to medical populations (e.g. Hickey and Mulcahy, 1973), it is likely to be useful in the treatment of more general populations of smokers as well.

While the efficacy of available weight control treatment approaches has yet to be systematically investigated in the prevention of weight gain, multi-component behavioral treatment approaches have produced the most consistnetly positive results in conventional clinical applications to weight loss (e.g. McReynolds and Lutz, 1976). This suggests that

the efficacy of a combined smoking control and preventive weight control treatment approach could be enhanced by substituting behavioral treatment for the dietary coulseling utilized by Hickey and Mulcahy (1973) and others.

An additional question remains, however, of whether the number and range of techniques used as components in multi-component weight control treatment programs are necessary to produce effectiveness. Romanczyk (1974), for example, compared self-monitoring of weight and caloric intake with several more complicated treatment packaged for weight control but found no significant differences between these treatment groups. A similar question may be raised concerning the degree of weight control intervention necessary to prevent weight gain and encourage long term weight control maintenance following smoking cessation. The purpose of this investigation was to compare the efficacy of several levels of preventive weight control intervention combined with smoking control treatment in producing smoking cessation and preventing weight gain during and following smoking control treatment.

METHODS

Participants were recruited by newspaper advertisements to participate in a study comparing various smoking cessation treatments designed for smokers fearful of gaining weight while quitting. Participants were then randomly assigned to the three treatment conditions. The treatment sample included 45 participants, 38 females and 7 males. The average participant was 40.2 years of age (SD = 11.17),

had been smoking for 22.2 years (SD = 10.07) and began treatment with a self-reported baseline smoking rate of 29 cigarettes per day (SD = 14.04). Using a standard height and weight chart (Metropolitan Life Insurance Company, 1960), 57% of the men and .09% of the women were found to exceed desirable weight limits at baseline. No significant differences were found between the three experimental groups in baseline smoking rate or in baseline body weight.

Treatment was conducted in five treatment meetings over a four week period; each participant attended two sessions the first week and one session each of the next three consecutive weeks. Treatment sessions were approximately one hour in length. Treatment was conducted in small groups (four to seven participants) by three instructors who each led one group in each treatment condition. Instructors included the author and two advanced graduate students in clinical psychology.

Weight control material specific to each treatment group was presented during the first half of each session. Participants in the minimum treatment condition discussed preventive weight control techniques as a group facilitated by the instructor. Intermediate treatment condition participants discussed preventive weight control techniques, monitored their eating habits daily and monitored their weight weekly. Maximum treatment group participants didcussed preventive weight control techniques, monitored their weight and eating habits and were presented with preventive weight control lessons supplemented with readings and homework exercises. The material presented to the maximum treatment group is summarized in Table 1. The three treatment

conditions are summarized in Table 2.

All treatment conditions employed regular paced aversive smoking, the smoking control treatment component, during the second half of each session. In this procedure participants are instructed to light a cigarette and inhale every 30 seconds while concentrating on the unpleasant sensations of smoking. Instructors offer verbal encouragement and prompts to increase concentration and attention to unpleasant sensations. Each treatment session included two five minute trials of regular paced aversive smoking separated by a five minute rest period. Regular paced aversive smoking is a variant of the rapid smoking procedure most recently and comprehensively reviewed by Danaher (1977). While initially used as a control treatment, regular paced aversive smoking has been found to produce treatment outcomes comparable to that of rapid smoking (e.g. Glasgow, 1978; Lando, 1975) while avoiding the careful participant screening required by the potential adverse physiological effects of rapid smoking (e.g. Hauser, 1974; Horan, Linberg and Hackett, 1977).

Participants' treatment outcome was assessed at posttreatment and at one, three and six months following treatment. While the posttreatment and final follow-up assessments were conducted in person, intermediate follow-up contacts were conducted entirely by mail. In addition to self-report via smoking diaries, informant reports and saliva thiocyanate values were used to assess smoking control outcome. Correlations between these three outcome measures and a discussion of the utility of multiple outcome measurements is reported separately (Grinstead and Christensen, 1982). Beginning one week prior to treat-

ment (baseline data collection) and through the final treatment week (posttreatment data collection), participants tallied each cigarette before it was smoked on a 3 by 5 card. Participants were weighed on a balance type scale in street clothes with shoes removed prior to baseline data collection, at posttreatment and again at six months posttreatment. At one and three months posttreatment smoking and weight data were self-reported by mail. A $50 deposit refundable on completion of the final assessment was utilized to decrease attrition over the long follow-up period.

RESULTS

A repeated measures ANOVA using time as the repeated measure showed no significant main or interaction effects of treatment condition for the dependent variable smoking rate. All participants' smoking rates changed significnatly over time as shown in Figure 1, $F(3,39) = 14.38$, $p < .00001$).

No significant differences were found between the treatment conditions in percentage of participants abstinent at posttreatment. Overall, 43% of participants were defined as abstinent at posttreatment and this percentage differed significantly from the 0% baseline abstinence, $X^2(1) = 19.09$, $p < .001$. This percentage of overall abstinence decreased over time to 31% at three months and 31% at six months posttreatment. Treatment group differences in percentage of abstinent participants were also not significant at one and three months posttreatment. At the time of the six month follow-up, however, treatment group differences approached significnace with the maximum, intermediate and minimum treatment groups

showing 15%, 50% and 29% abstinence respectively.

A repeated measures ANOVA with time as the repeated measure showed no significant main effects of treatment condition for the dependent variable body weight. An additional one way ANOVA showed participants weight to have changed significnatly over time as shown in Figure 2, $F(4,100) = 4.13$, $p < .005$. These mean weight changes were quite small, however,and unlikely to represent clinically significant weight changes.

Comparing each participants' baseline weight with their weight six months following treatment, 63% weighed more ($M = 6.97$ pounds, $SD = 6.18$) and 33% weighed less at six months posttreatment ($M = 2.70$ pounds, $SD = 1.81$). The remaining participants showed no weight changes. The largest overall weight gain was 20 pounds with over 60% of participants who gained gaining less than five pounds.

DISCUSSION

Smoking control treatment outcome results for the entire sample indicate a posttreatment abstinence rate of 43% which is appreciatively lower than that found in previous investigations of aversive smoking (e.g. Harris and Lichtenstein, 1971; Schmahl, Lichtenstein and Harris, 1972). While it is possible that a smoking control procedure more closely approximating Lichtenstein's original format would have produced more positive results (Danaher, 1977), it is also possible that the weight conscious smokers recurited for this study differ from treatment populations of these earlier reports. Fear of weight gain may interfere with their motivation and/or ability to stop smoking and these weight conscious smokers are likely to have experienced more previous failed

cessation attempts than other smokers.

No significant main effects of treatment condition were found for either outcome measure smoking rate of body weight. The only measure in which treatment effects approached significance was group percentage of abstinence at six months posttreatment in which the intermediate treatment group showed the highest proportion of abstinent smokers. In fact, the 50% abstinence found in this group exceeds the overall abstinence rate at posttreatment. Contrary to expectations, the maximum treatment group showed the poorest abstinence rate at the six month follow-up.

The maximum treatment condition was differentiated by the presentation of a structured, systematic preventive weight control component including lectures and homework assignments. Given that all treatment groups performed well in preventing weight gain, it is possible that simply orienting participants to this issue is sufficient to prevent weight gain. If this is true, the maximum treatment condition represents an unnecessary and potentially alarming emphasis on weight control that may have actually adversely affected long term smoking control among that group's members.

As the treatment manipulation was expected to have had its primary effect on body weight, the absence of weight differences between treatment groups deserves further comment. In addition to orienting participants to the causes of the prevention of weight gain following smoking control attempts, the treatment groups provided structure and social support for participants. It is possible that structure and social support combined with an initial orientation to the issue of preventing weight gain is sufficient. Similar conclusions were drawn by McFall and Hammen (1971) regarding smoking treatment.

TABLE 1

Summary of Maximum Treatment Condition
Weight Control Lessons

Week #	Lesson Title	Content of Lesson
1	Overview	Orientation to behavioral causes of weight gain (e.g. snacking instead of smoking). Solutions to problem situations.
2	Stimulus Control	How to avoid social and environmental cues to overeat and alternative behaviors (e.g. leaving the table immediately after eating).
3	Cognitive Control	Replacing negative self-statements about weight gain with coping thoughts. Use of praise and self-reinforcement.
4	Exercise Management	Encouraged small, consistent changes in daily caloric output (e.g.using stairs instead of elevator) to control weight.
5	Maintenance	Review of social, environmental and cognitive manipulations with emphasis on long range planning. Encouraged ongoing monitoring of weight to prevent gaining weight over time.

TABLE 2

Description of Treatment Conditions

Treatment Condition	N	Description of Treatment Components
1 (Maximum)	13	Regular paced aversive smoking Discussion of weight control techniques Self-monitoring of weight and eating habits Preventive weight control lessons/ homework
2 (Intermediate)	14	Regular paced aversive smoking Discussion of weight control techniques Self-monitoring of weight and eating habits
3 (Minimum)	18	Regular paced aversive smoking Discussion of weight control techniques
	45	

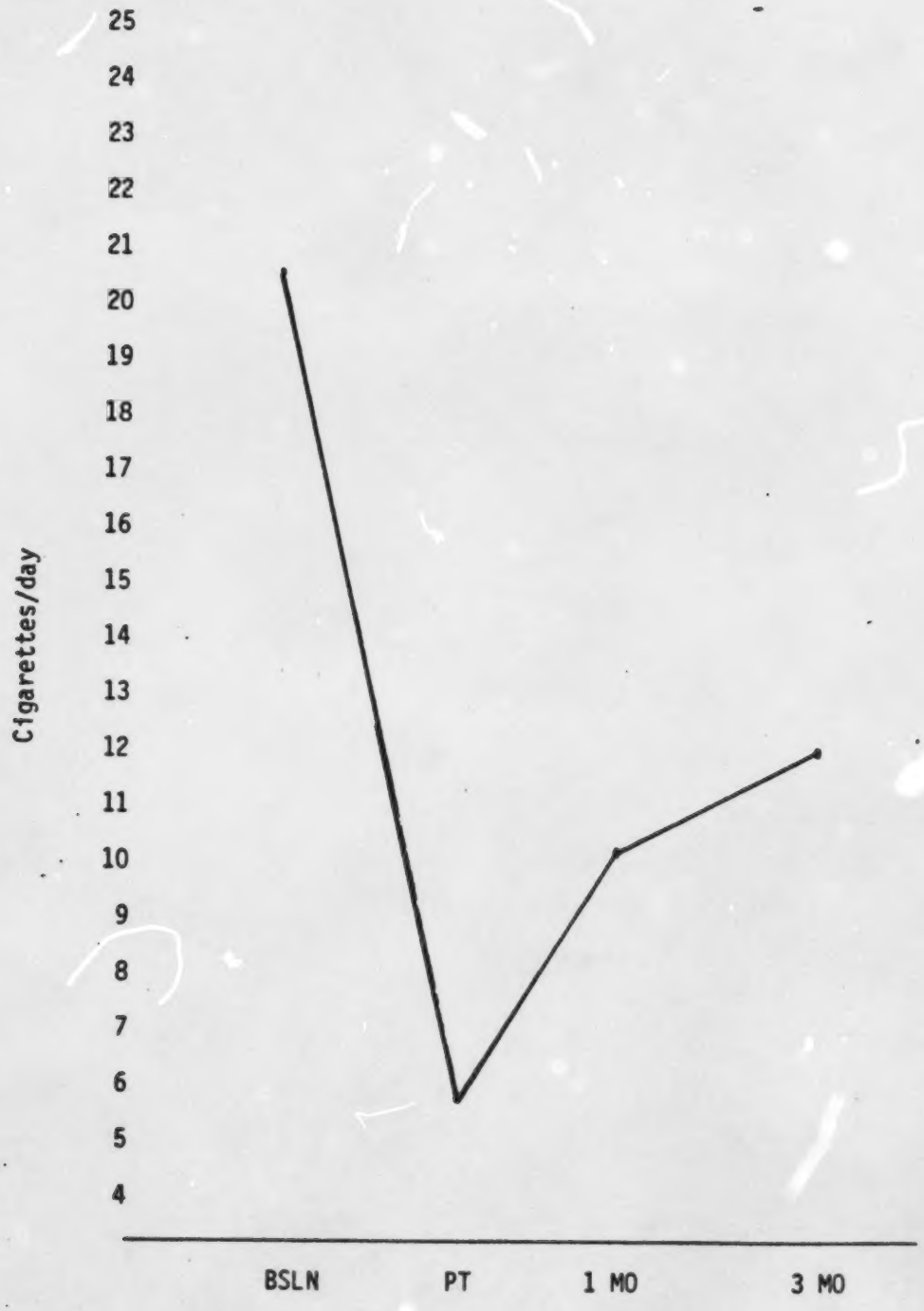

FIGURE 1 Change in smoking rate over time

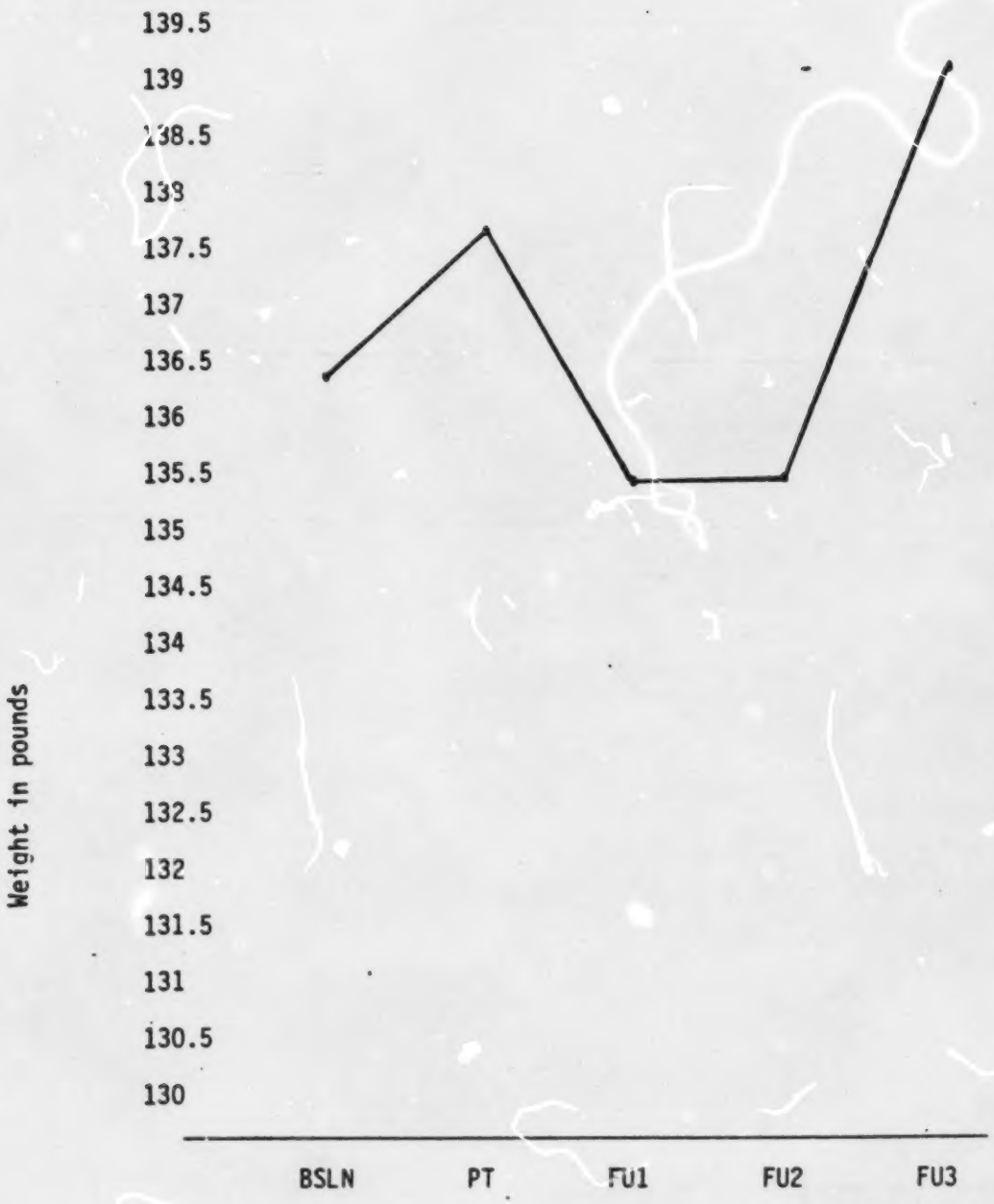

FIGURE 2 Weight change over time

REFERENCE NOTES

Grinstead, O.A. and Christensen, A. The validity of particiapants' reports of smoking control treatment outcome. Paper presented at the annual meeting of the Western Psychological Association Conference, Sacramento, April, 1982.

Harris, D.E. and Lichtenstein, E. Contribution of non-specific social variables to a successful behavioral treatment of smoking. Paper presented at the annual meeting of the Western Psychological Association, San Francisco, April, 1971.

REFERENCES

Best, A.J., Bass, F. and Owen, L.E. Mode of service delivery in a smoking cessation programme. Canadian Journal of Public Health, 1977, 68, 469-473.

Brozek, J. and Keys, A. Changes of body weight in normal men who stop smoking cigarettes. Science, 1957, 125, 1203.

Colletti, G. and Supnick, J.A. Continued therapist contact as a maintenance strategy for smoking reduction. Journal of Consulting and Clinical Psychology, 1980, 48, 665-667.

Comstock, G.W, and Stone, R.W. Changes in body weight and subcutaneous fatness related to smoking habits. Archives of Environmental Health, 1972, 24, 271-276.

Danaher, B.G. Research on rapid smoking; interim summary and recommendations. Addictive Behaviors, 1977, 2, 151-166.

Garvey, A.J., Bosse, R. and Seltzer, C.C. Smoking, weight changes and age; a longitudinal analysis. Archives of Environmental Health, 1967, 14, 865-871.

Glasgow, R.E. Effects of a self-control manual, rapid smoking and amount of therapist contact on smoking reduction. Journal of Consulting and Clinical Psychology, 1978, 46, 1439-1447.

Hauser, R. Rapid smoking as a technique of behavior modification; caution in selection of subjects. Journal of Consulting and Clinical Psychology, 1974, 42, 625-626.

Heyden, S., Cassel, J.C. and Baitel, A. Body weight and cigarette smoking as risk factors. Archives of Internal Medicine, 1971, 128, 915.

Hickey, N. and Mulcahy, R. Effect of cessation of smoking on body weight after myocardial infarction. American Journal of Clinical Nutrition, 1973, 26, 385-386.

Horan, J.J., Linberg, S.E. and Hackett, G. Nicotine poisoning and rapid smoking. Journal of Consulting and Clinical Psychology, 1977, 45, 344-347.

Khosla, T. and Lowe, C.R. Obesity and smoking habits by social class. British Journal of Preventive Social Medicine, 1972, 26, 249-256.

Krasnegor, N.A. (Ed.) Cigarette smoking as a dependence process (NIDA Research Monograph Series #23, DHEW Publication #ADM-79-800), Washington, D.C., U.S. Government Printing Office, 1979.

Lando, H.A. A comparison of excessive and rapid smoking in the modification of chronic smoking behavior. Journal of Consulting and Clinical Psychology, 1975, 43, 350-355.

Lichtenstein, E. and Danaher, B.G. Modification of smoking behavior: a critical analysis of theory, research and practice. In M. Hersen. R.M. Eisler and P.M. Miller (Eds.), Progress in behavior modification, (Volume #1). New York, Academic Press, 1976.

Lichtenstein, E., Harris, D.E., Birchler, G.R., Wahl, J.M. and Schmahl, D.P. Comparison of rapid smoking, warm, smoky air and attention placebo in the modification of smoking behavior. Journal of Consulting and Clinical Psychology, 19.3, 40, 92-98.

Marlatt, G.A. and Gordon, J.R. Determinants of relapse: implications for the maintenance of behavior change. In P.O. Davidson (Ed.), Behavioral medicine; changing health lifestyles. New York; Brunner/Mazel, 1979.

McFall, R.M. and Hammen, C.L. Motivation, structure and self-monitoring; role of non-specific factors in smoking reduction. Journal of Consulting and Clinical Psychology, 1971, 37, 80-86.

McReynolds, W.T. and Lutz, R.N. Weight loss resulting form two behavior modification procedures with nutritionists as therapists. Behavior Therapy, 1976, 7, 283-291.

Metropolitan Life Insurance Company. Frequency of overweight and underweight. Statistical Bulletin of the Metropolitan Life Insurance Company, 1960, 41, 4-7.

Norton, G.R. and Barske, B. The role of aversion in rapid smoking treatment procedure. Addictive Behaviors, 1977, 2, 21-25.

Romanczyk, R.G. Self-monitoring in the treatment of obesity; parameters of reactivity. Behavior Therapy, 1974, 5, 531-540.

Schmahl, D.P., Lichtenstein, E. and Harris, D.E. Successful treatment of habitual smokers with warm, smoky air and rapid smoking. Journal of Consulting and Clinical Psychology, 1972, 38, 105-111.

Sjoberg, L. and Johnson, T. Trying to give up smoking; a study of volitional breakdowns. Goteborg Psychological Reports, 1976, 6, 13.

Smoking and Health; a report of the Surgeon General. U.S. Department of Health, Education and Welfare, Public Health Service, Washington, D.C.; U.S. Government Printing Office, 1979.

Vogt, T.M., Selvin, S. and Billings, J.H. Smoking cessation program baseline carbon monoxide and serum thiocyanate levels as predictors of outcome. American Journal of Public Health, 1979, 69, 1156-1159.

Wilhelmsen, L. One year's experience in an anti-smoking clinic. Scandinavian Journal of Respiratory Diseases, 1968, 49, 251-259.

Wynder, E.L., Kaufman, P.L. and Lester, R.L. A short-term follow-up study on ex-cigarette smokers with special emphasis on persistent cough and weight gain. American Review of Respiratory Diseases, 1967, 96, 645-655.

Please send requests for copies of this paper to Olga Grinstead, The Claremont Colleges, Monsour Counseling Center, 735 Dartmouth Ave., Claremont, CA 91711